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ABSTRACT

Tables showing the types of Educational Resources Information Center (ERIC) products and their dispersion provide background information for the executive summaries of usage study design reports focusing on three levels: (1) system operations; (2) subscribers to the services provided; and (3) the ultimate "end-users" of the service. The summaries emphasize the important points of each type of study. The first level report addresses ERIC as an information network and describes a framework for comprehending, examining, and managing the ERIC system. It also describes useful data categories and appropriate levels of data collection; suggests a method of developing a model data system; and examines these suggestions with respect to current possibilities. The second level report recommends non-experimental approaches to ERIC use assessments and examines methodological and research design considerations for usage studies. The third level report focuses on ERIC impact studies and analyzes them in terms of methodological recommendations and specific impact studies are included. A bibliography of ERIC usage/impact studies is also included. (CWM)

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ERIC/IR
Special Project Report

DESIGN OF ERIC USAGE STUDIES

Volume I

ERIC Clearinghouse on Information Resources
Syracuse University
1978

IR007470

TABLE OF CONTENTS

VOLUME I

Page

Introduction to Report 1

Figure 1. Types of Usage Studies 1

Figure 2. ERIC Products -- Distribution Statistics (Geographic) 3

Table 1a. Major ERIC Services and Products 5

Table 1b. What Would You Like to Know About ERIC Products and Services? 6

Table 2. ERIC User Typology 7

Table 3a. RIE Subscribers and Microfiche Standing Order Customers in 20 Large U.S. Cities 9

Table 3b. Ownership of ERIC Microfiche Collections and RIE Subscriptions Among Large College and University Libraries 10

Table 3c. Ownership of ERIC Microfiche Collections and RIE Subscriptions Among Large Public Libraries 11

Table 3d. Comparison of RIE Subscriptions and ERIC Microfiche Collection Ownership in Eleven States 12

Executive Summaries

Level I ERIC Usage Study: Data Gathering for the Management of ERIC as an Information Network by Evelyn Daniel 13

Level II ERIC Usage Study: Recommendations on Non-Experimental Approaches to ERIC Use Assessments by B. K. L. Genova 21

Level III ERIC Usage Study: ERIC "Impact Studies" -- Methodological Recommendations for Future Research and a Review of Previous Work by Jeffrey Katzer 29

Bibliography of ERIC Usage/Impact Studies 37

VOLUME II -- Appendices

INTRODUCTION TO REPORT

Most information systems like ERIC can be viewed on different levels and assessment studies can be made using different data collection techniques. It is possible that any number of questions could be asked about ERIC products and services (see Table 1a), but we think answers to these questions need to be viewed with respect to the end-users of ERIC, e.g., the school teachers or

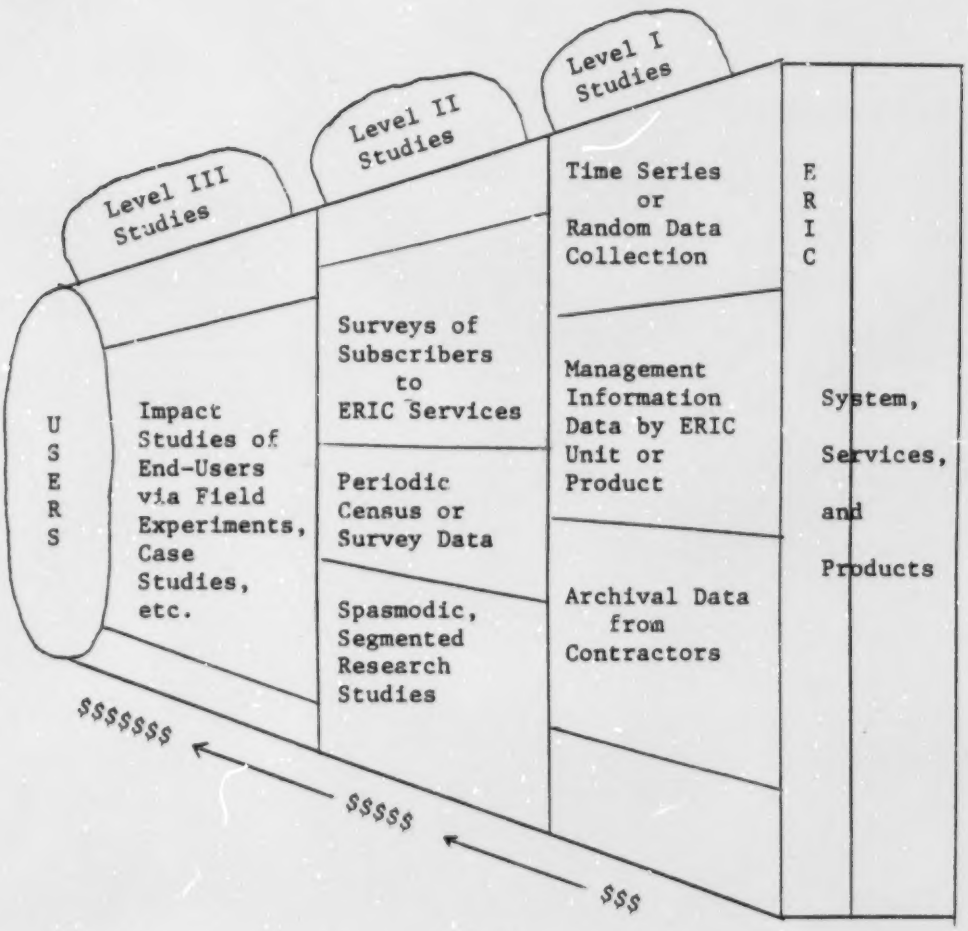
Level III Studies
Level II Studies
Level I Studies
USERS
Impact Studies of End-Users via Field Experiments, Case Studies, etc.
Surveys of Subscribers to ERIC Services
Periodic Census or Survey Data
Spasmodic, Segmented Research Studies
Time Series or Random Data Collection
Management Information Data by ERIC Unit or Product
Archival Data from Contractors
ERIC System, Services, and Products
$$$$$$$
$$$$$
$$$

Figure 1. Types of Usage Studies with Varying Data Collection Methods and Analysis, Variation in Implementation Costs, Validity, Reliability

graduate students who are impacted by their use of ERIC. This is a complex user group to study (see Table 2).

In Figure 1 we are attempting to display the various "levels" of studies which are possible, depending on the amount of data available from:

1. system operations (Level I),
2. subscribers to the services provided (Level II), and
3. the ultimate "end-users" of the service (Level III).

As the study design focuses more on the "Users of ERIC", the costs of such a study become larger, the data is more complex to organize and analyze, and the impact assessments become more reliable.

If assessment studies rely on survey data of subscribers (Level II), they may result in gross statistics (see Figure 2) about "use", but the validity of the data is suspect if the study design does not include other kinds of data from these sources. Such studies can tell us a great deal about spread of ERIC products, but not about impact. Most of the existing ERIC studies (see Bibliography with this report) are of the survey type.

We estimate that the three levels of study represent orders of magnitude differences in cost to implement. If Level I is estimated to cost $5,000/yr, Level II would cost $50,000 and Level III would cost $500,000 -- if full scale, reliable, and valid study designs are implemented. This report includes examples of each level of study.

For practical purposes, as a start, we would recommend some sort of benchmark study on Level II and a normalization of data collection on Level I which would give the Central ERIC and NIE staff some current information about ERIC as an information network, and ERIC as a system of services and products. The use of ERIC can only be monitored in "retail outlets" such as libraries, school media centers, and the like. Tables 3a-d following the Introduction give

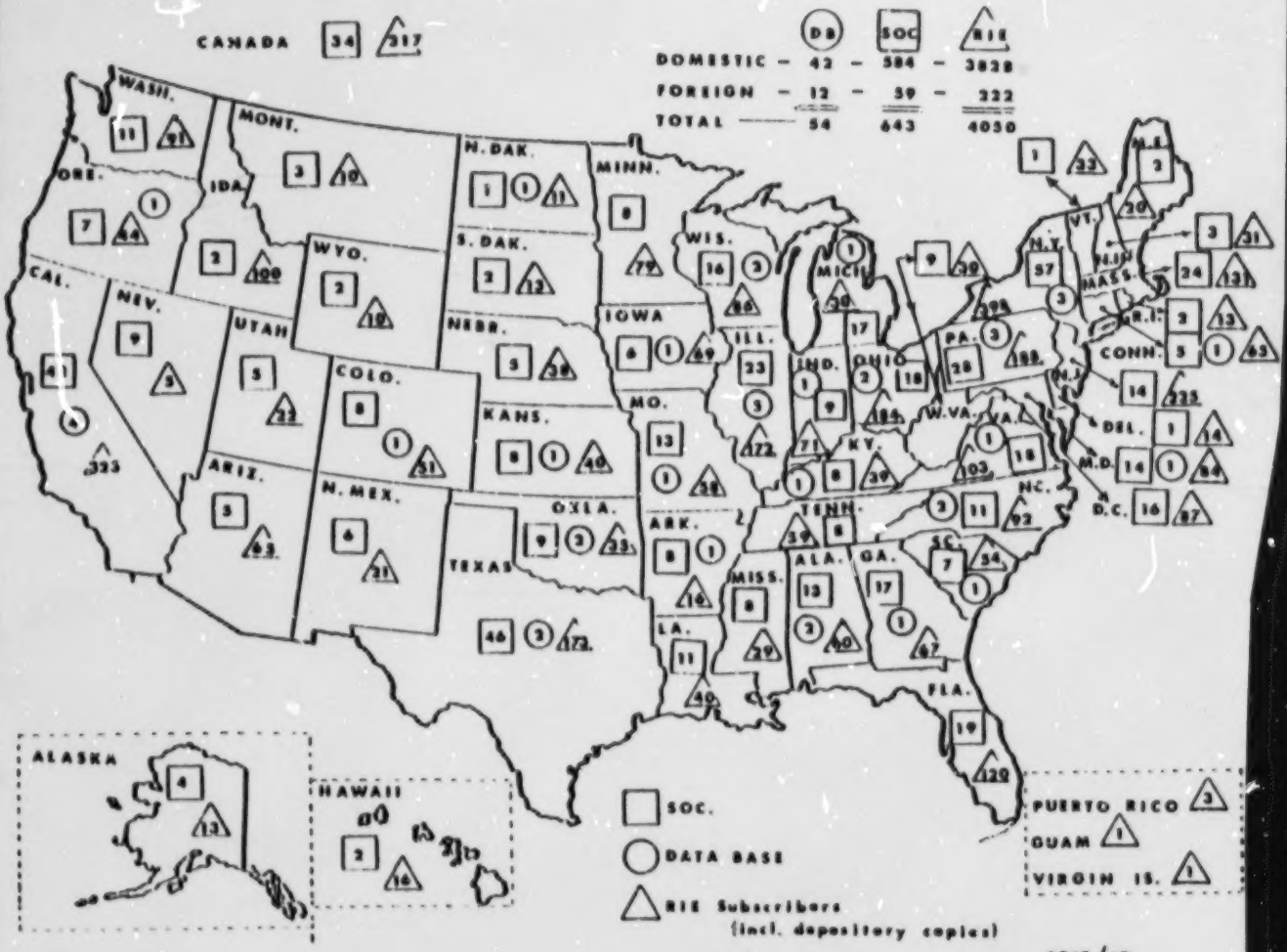

Figure 2. ERIC PRODUCTS - DISTRIBUTION STATISTICS (GEOGRAPHIC)

ERIC / IR
11/78

us some idea of the dispersion of ERIC products, but only a careful Level II study such as that suggested by Dr. Genova in this report could give us a reliable picture of the variety of user services associated with those outlets.

For each level of study we provide an executive summary in the body of this report. The appendix contains the full reports received from the three consultants who each directed their attention to a different level of study. The summaries were developed by the project director to emphasize the important points of each type of study.

We hope the other information provided in this report will supply Central ERIC and NIE with background for future studies. We appreciate the cooperation we received during the course of this project from NIE and ERIC staff, from researchers, Clearinghouse, and Standing Order Customer personnel, and from ERIC contractors. Our visits to many sites provided useful background information which was not obtainable in any other way.

Table 1a. MAJOR ERIC SERVICES AND PRODUCTS

ERIC Products (available from ERIC contractors)

CIJE - subscription (monthly, semi-annually, cumulation)

RIE - subscription (monthly issues and annual, semi-annual index)

Microfiche of RIE item (EDRS) - (on subscription - monthly and back collection - on demand)

Hard copy of RIE items (EDRS) on demand

ERIC tapes - subscription (ERIC/Facility)

Descriptor and Identifier Usage Report

ERIC Information Analysis Products (1967-72)

Institutional Sources in ERIC

Reading/Project Number Index, Cumulative

Title Index

Educational Documents Abstract

Educational Documents Index Institutions (1966-71)

Clearinghouse # to ED # Cross Reference List

Contract/Grant Number Index

Clearinghouse (CH) and ERIC Facility Products

Journal Columns

Information Analysis Products

Special Bibliographies

Clearinghouse Newsletters

Promotional Brochures

Instructional Media Package

ERIC Data Base Directory (Facility)

ERIC Microfiche Collection Directory (Facility)

ERIC - What It Is

Thesaurus of ERIC Descriptors

ERIC Processing Manual (ED 092 164)

Standing Order Customer (SOC) Products

Promotional Brochures -
- Columns in journal or newsletter on ERIC

ERIC Training Manuals -
- Media on ERIC
- Display on ERIC

Computer-Based ERIC Search Systems at sites other than ERIC Contractors

Software System to Search ERIC Online and Batch (ORBIT, COSMOS, DIALOG, BRS, etc.)

Order ERIC (on SDC/ORBIT)

Clearinghouse (CH) and ERIC Facility Services

User Services
- Bibliographies on demand
- Telephone Inquiries
- Mail Inquiries
- Workshops at Professional Meetings
- Linkages to Professional Organizations
- Computer Searches

Services to SOCs
- Brochures
- Training Workshops
- Reference Assistance

Standing Order Customer (SOC) Services

Computer-based ERIC Searches

Reference Questions

ERIC Training/Instruction/Orientation

Referral Services (to CHs, Facility, etc.)

Fiche reading equipment - circulation, inhouse use

Fiche copying equipment

Fiche printing equipment

Order MF/HC from EDRS

Table 1b

WHAT WOULD YOU LIKE TO KNOW ABOUT
ERIC PRODUCTS AND SERVICES?

Some possible questions which can/cannot be answered by ERIC Usage Studies.

I. ERIC Products (Level I study)

Paying and non-paying customers for each product:
- a) # subscribers (changes (adds & deletes) over time -- absolute number and by type)
- b) # copies printed (longitudinal study of "continuous products" on annual basis or by edition)
- c) # copies distributed free
- d) # copies sold on demand

II. CH Products (Level I study)

for each type of product with estimate of audience reached:
- a) # IAP -- printed & distributed (free & charge)
- b) CH newsletter -- # on mailing list
- c) # ERIC media kits -- distributed, circulated, or sold
- d) promo brochures -- # distributed
- e) # displays -- estimated audience
- f) # journal columns with readership population/journal

III. CH Services (Level I study)

- a) # workshops -- in attendance (by user typology)
- b) # inquiries (by type)
- c) # professional organization liaison -- # members in each organization
- d) # user services
- e) # microfiche reading equipment

IV. SOC Products -- same as CH Products

V. SOC Services -- same as CH Services

VI. Computer-Based ERIC Retrieval Services

For each service:
- a) # searches (by passwords sign-ons/month), # documents retrieved and offline prints; # searches (free & fee)
- b) # SDI (save searches) -- by use type
- c) # ERIC items ordered online (microfiche or hard copy)
- d) # customers (end users) for services (monthly & annual) -- by user type -- ranked with other data bases used
- e) # times ERIC Thesaurus is accessed online (COSMOS, DIALOG only)

CAUTION:

1. To assure accuracy and representativeness of data, need Level II study.

2. For all of the above, add the question: What has been the impact on end user of all of this activity? (Level III study)

Table 2

ERIC USER TYPOLOGY

I

Personal Characteristics

Age group
Highest degree

II

Position (Job Function)

Chief administrator, deputy, or assistant
Dean, department head, director
Principal, assistant principal
Administrator, planner
Curriculum supervisor, supervisor of instruction
Guidance counselor, school psychologist
Information resources specialist (librarian, media specialist)
Personnel administrator, training
Program specialist
Consultant
Researcher, evaluator
School board members
Teacher/Professor - arts, humanities
Teacher/Professor - English, reading, language
Teacher/Professor - math, science
Teacher/Professor - social sciences
Teacher/Professor - vocational, technical, health, physical ed., homemaking
Teacher/Professor - non-subject orientation
Teacher/Professor - education (inc. methods), teaching supv.
Teacher/Professor - professional field (e.g., medicine, law, nursing)
Student, undergraduate
Student, graduate
Professional organization - staff person
Lay person

III

Levels (from:)

A. **School**
Preschool
Elementary (K-6)
Middle or junior high
High school
College (2 years)
College (4 years), university
Adult, continuing education
Multi-level

B. **Government or Political Unit**
International country (other than U.S.)
Federal (national)
State
Regional
County
Local district
Local town, city

C. **Private Units** (non-school, non-political)
Commercial/industrial
Private/non-profit
Personal/individual

IV

Use Via ERIC Unit

ERIC Facility or CH
ERIC Commercial - (EDRS, MacMillan)
ERIC Commercial - 2nd level - (BRS, ORBIT, DIALOG)
ERIC Government - 2nd level - (regional labs, SEA, etc.)
ERIC Private - 2nd level - SOC's
ERIC - SOC (other than above)
Educational Information Centers
Academic libraries
Public libraries
School district service
(EPSIS, SMERC, WISE, RISE)

V

Request Made

1. In person/on site
2. By telephone
3. By mail

VI

Amount of Use (per month)

Heavy
Moderate
Light

VII

Purposes

Finding answers to specific questions
Keeping aware of developments and activities in education
Keeping aware of who is knowledgeable in a subject or problem area
Identifying sources of assistance for improving own work
Identifying educational programs, methods, materials, or products
Developing alternative approaches to solving problems
Evaluating educational practices or products
Locating information for others

VIII

Use Results in Product

Speech
Journal article
Chapter in a book, monograph
Bibliography
Course related paper
Research proposal
Development proposal
Training proposal
Thesis, dissertation
Newspaper article
Script for film, TV, slides
Program development report
Curriculum development report
Evaluation report
Classroom instruction preparation
Administrative planning report
Personal development
Professional development

Tables 3a-d

ERIC Products -- Geographic - Institutional Distribution

The following tables form a set which were developed for background information on the distribution of RIE subscriptions and ERIC Microfiche Standing Order Customers. Although the data are not as up to date as we would like, they do show the variation in availability of these ERIC products. Some cities, some states, some public libraries, and some university libraries are surprisingly without these ERIC products, or do not have the number of copies available, which appears to be commensurate with their size, the size of enrollment, or their relative percentage of educational expenditure.

Table 3a

RIE Subscribers and Microfiche Standing Order Customers
IN 20 LARGE U.S. CITIES

City	Number of RIE Subscriptions (inc. depository copies)	Number of ERIC Microfiche Collections
Baltimore, MD	18	5
Boston, MA	27	8+
Chicago, IL	44	6
Cleveland, OH	17	1
Dallas, TX	13	2
Detroit, MI	13	2
Houston, TX	10	4
Indianapolis, IN	10	1
Los Angeles, CA	27	4
Memphis, TN	8	1
Milwaukee, WI	21	2
New Orleans, LA	11	1
New York, NY	88*	18**
Philadelphia, PA	23	5
Phoenix, AZ	16	1
St. Louis, MO	18	3
San Antonio, TX	12	3
San Diego, CA	11	3
San Francisco, CA	12	3
Washington, DC	87	16

*Including Brooklyn (20), Bronx (11), Staten Is. (3), Queens (2)
+Including Cambridge (2)
**Including Brooklyn (1), Bronx (3), Staten Is. (2), Queens (2)

Table 3b. Ownership of ERIC Microfiche Collections and RIE Subscriptions Among LARGE COLLEGE AND UNIVERSITY LIBRARIES

Rank order of large college and university libraries by number of volumes: 1975-76

Institution	RIE Subscription (inc. depository copy)	ERIC Microfiche Collection
Harvard Univ.	yes	yes
Yale Univ.	yes	no
Univ. of Illinois - Urbana	*yes	yes
Univ. of Michigan - Ann Arbor	yes	yes
Univ. of California - Berkeley	yes	yes
Columbia Univ.	yes	yes
Univ. of Chicago	yes	yes
Stanford Univ.	yes	yes
UCLA	yes	yes
Univ. of Texas - Austin	yes	yes
Cornell Univ.	yes	yes
Univ. of Minnesota - Minneapolis	yes	yes
Univ. of Wisconsin - Madison	yes	yes
Indiana Univ. - Bloomington	yes	yes
Northwestern Univ.	*yes	yes
Ohio State Univ. - Columbus	yes	yes
Princeton Univ.	yes	no
Duke Univ.	yes	no
Univ. of Pennsylvania	yes	no
New York Univ.	*yes	yes
Univ. of Washington	yes	yes
Univ. of North Carolina - Chapel Hill	*yes	yes
Johns Hopkins University	*yes	yes
Univ. of Virginia - main campus	yes	yes
Univ. of Iowa	yes	yes
Univ. of Pittsburgh	yes	yes
Brown Univ.	*yes	no
Univ. of Utah	*yes	yes
Univ. of Missouri - Columbia	*yes	yes
Univ. of Florida	yes	yes
Univ. of Kansas - main campus	*yes	yes
Univ. of Southern California	yes	yes
Michigan State Univ.	yes	yes
Washington Univ.	*yes	yes
MIT	*yes	no
Univ. of Georgia	yes	yes
Louisiana State Univ. & A&M College	yes	yes
Syracuse University	yes	yes
Case Western Reserve Univ.	yes	no
Univ. of Maryland - College Park	yes	yes
Southern Illinois Univ. - Carbondale	yes	yes
Brigham Young Univ. - Provo	*yes	yes
Univ. of Rochester	*yes	yes
Univ. of Hawaii - Manoa	no	yes
SUNY at Buffalo	yes	yes
Penn State - main campus	yes	yes
Emory Univ.	*yes	no
Univ. of Connecticut	*yes	yes
Univ. of Colorado	yes	yes

*depository copy

Table 3c

Ownership of ERIC Microfiche Collections and RIE Subscriptions Among LARGE PUBLIC LIBRARIES

Rank order of public libraries with million or more volumes in its collections: 1974

City	RIE Subscription (inc. depository copy)	ERIC Microfiche Collection
New York Public Library	yes	yes
Chicago Public Library	yes	yes
Los Angeles Public Library	*yes	no
Los Angeles County Public Library	yes	no
Boston Public Library	yes	yes
Cleveland Public Library	*yes	no
Cincinnati-Hamilton County Pub. Lib.	*yes	no
Free Library of Philadelphia	*yes	no
Queens Borough Public Library	*yes	yes
Buffalo & Erie County Public Library	*yes	no
Brooklyn Public Library	*yes	no
Milwaukee Public Library	*yes	no
Enoch Pratt Free Library (Baltimore)	*yes	no
Detroit Public Library	*yes	no
Carnegie Library of Pittsburgh	*yes	no
Public Library of Washington, DC	*yes	no
Hawaii State Library	*yes	no
Houston Public Library	*yes	no
San Francisco Public Library	*yes	yes
Seattle Public Library	*yes	no
Denver Public Library	*yes	no
Dallas Public Library	*yes	yes
Pub. Lib. of Fort Wayne & Allen County	yes	no
Minneapolis Public Library	*yes	no
St. Louis Public Library	*yes	no
Cuyahoga County (Ohio) Public Library	no	no
St. Louis County Library	*yes	no
San Diego Public Library	*yes	no
Dayton & Montgomery County Public Lib.	*yes	no
Baltimore County Public Library	*yes	no
Kansas City Public Library	*yes	yes
Columbus Public Library	*yes	no
Memphis & Shelby County Library	yes	no
Indianapolis-Marion County Library	no	no
Toledo-Lucas County Library	*yes	no
Public Library of Newark	yes	no
Library Association of Portland	*yes	no
Louisville Free Public Library	*yes	no

*depository copy

Table 3d

COMPARISON OF RIE SUBSCRIPTIONS AND
ERIC MICROFICHE COLLECTION OWNERSHIP IN ELEVEN STATES

STATE	# OF FULL-TIME & PART-TIME CLASSROOM TEACHERS IN PUBLIC & NONPUBLIC ELEM. & SEC. DAY SCHOOLS, BY STATE, (FALL 1977) (estimated)[a]	TOTAL ENROLLMENT IN INSTITUTIONS OF HIGHER ED., (FALL 1976)[b]	DIRECT EXPENDITURES OF STATE & LOCAL GOV. FOR ALL FUNCTIONS & FOR EDUCATION, BY % OF PER CAPITA INCOME (1974-75)[c]	# OF RIE SUBSCRIPTIONS[d]	# OF ERIC MICRO-FICHE COLLECTIONS
Alaska	4,510	18,500	12.0	(9) 13	2
Wyoming	5,080	19,183	10.4	(5) 10	2
Nevada	6,050	29,995	6.5	(2) 5	2
New Mexico	13,600	54,435	10.5	(13) 21	6
Utah	13,110	85,682	11.0	(14) 22	5
Arkansas	22,290	67,453	6.5	(3) 16	8
Oklahoma	31,050	145,196	6.9	(19) 35	9
Connecticut	42,180	145,136	6.0	(53) 65	5
Missouri	53,210	221,927	6.7	(36) 58	13
New Jersey	91,320	290,603	6.8	(139)225	14
Ohio	118,810	444,913	6.5	(137)184	18

[a]Sources: U.S. Dept. of HEW, National Center for Education Statistics, Statistics of Public Elementary and Secondary Day Schools, Fall 1976; and Estimates of the National Center for Education Statistics.

[b]Source: U.S. Dept. of HEW, National Center for Education Statistics, Fall Enrollment in Higher Education, 1976.

[c]Sources: U.S. Dept. of Commerce, Bureau of Economic Analysis, Survey of Current Business, August 1977; and Bureau of the Census, Governmental Finances in 1974-75, Series GF 75, No. 5.

[d]Number in parentheses represents total before addition of depository copies.

EXECUTIVE SUMMARY*

Level I ERIC Usage Study

Data Gathering for the Management of ERIC
as an Information Network

by Evelyn Daniel

A. ERIC is a decentralized information system with a mission to build a data base, produce related products, and provide services.

1. Integration and continued differentiation among the units of ERIC create dynamic tensions within the system.

2. Efforts to control, much less direct, the growth of the system are affected by attempts to balance these tensions toward differentiation.

3. The view of four "hierarchical" levels (government, commercial, non-commercial, private) fails to provide a useful framework. A more helpful framework for comprehending ERIC as a system would accommodate a variety of perspectives -- that of the funder, the manager, the staff, and the user.

4. The ERIC Clearinghouses have functions which present problems of allegiance and disorientation.

B. ERIC Network Articulation

If ERIC is seen as a system of products, then a relatively simple marketing model, looking at sales, costs and returns, geographic distribution, number of continuing customers, etc. would be sufficient. It is apparent from the emphasis placed on the end use that this product orientation is not acceptable. Rather, a view of ERIC as a system of services seems the appropriate model and has the added advantage of alignment with current results-oriented management theory.

Looking at ERIC as a system of services, the SOCs become the primary outlet point, the place where the end user interfaces with the ERIC system. This means that the SOCs might helpfully be considered as elements of the ERIC system and not external to it. (This does not imply that Central ERIC would or need formally control the SOCs in the way in which the Clearinghouses are "controlled".)

In terms of policy and allocation of resources, this view of ERIC would require greater attention to the SOCs, development of incentive plans to encourage the SOCs to play a more responsive role, and a stronger hierarchical network concept. Presently, the Clearinghouses vary in the amount of contact and concern with the SOCs, and the SOCs do not understand or recognize the Clearinghouse role. The greater attention to the SOCs now being initiated has great implications for the Clearinghouses.

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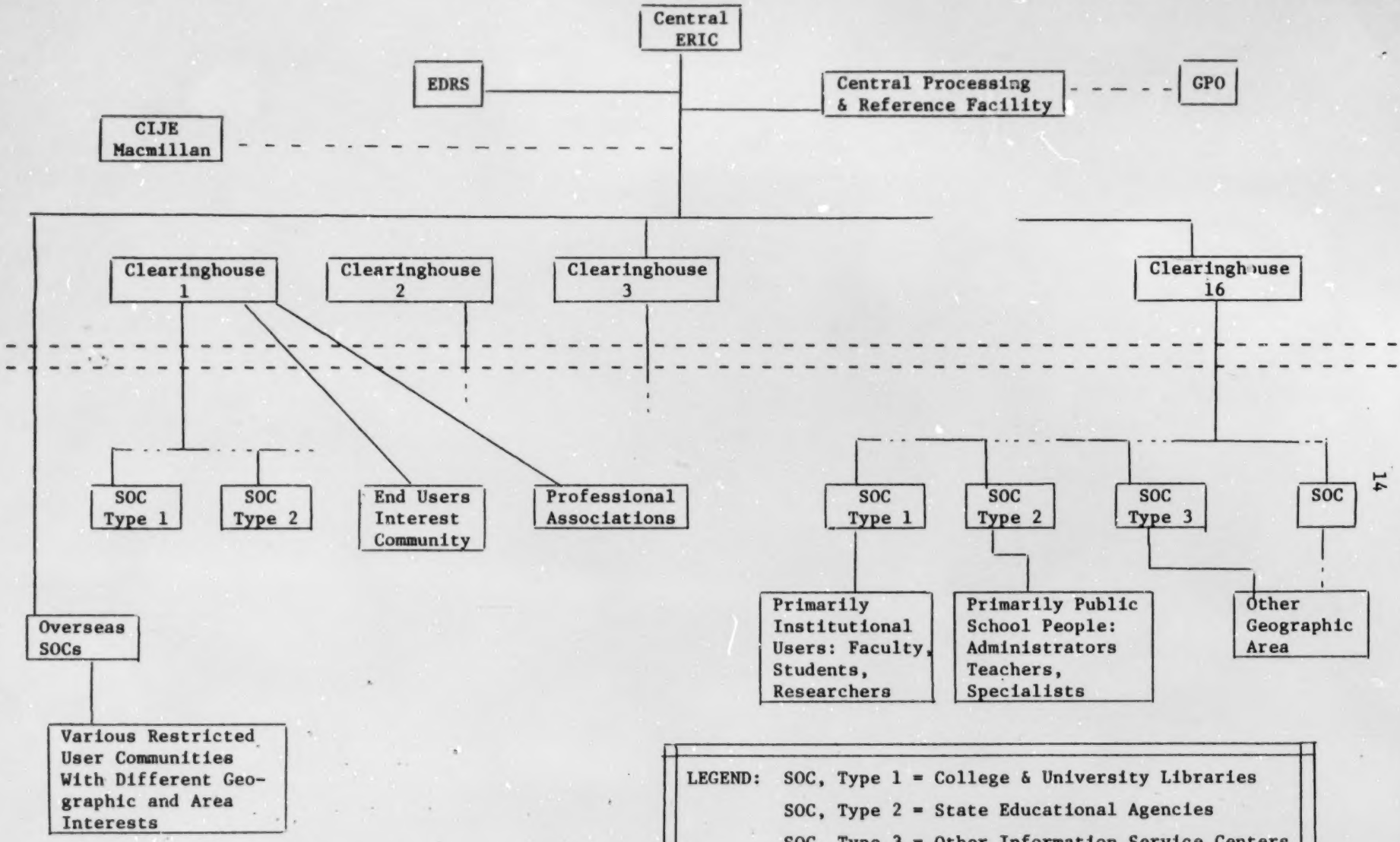
*See Appendix of this report for consultant's report upon which this summary is based.



LEGEND: SOC, Type 1 = College & University Libraries

SOC, Type 2 = State Educational Agencies

SOC, Type 3 = Other Information Service Centers

The double horizontal line through this figure marks the formal and informal levels of control by ERIC.

Figure I.1 Articulted ERIC Network.

C. The ERIC Clearinghouses as the primary collecting point for use data.

In the past, Central ERIC commissioned national user studies to document the value and the impact of the ERIC system. The Clearinghouses provide data quarterly to Central ERIC. The data collected, however, are often gross aggregates. Perhaps even some inaccuracies occur in the present use data collected by the Clearinghouses, at least to be collected only for reporting purposes and not for management decision making. The accuracy of the data would undoubtedly be enhanced if they were meaningful and useful to the level where they are being collected.

At levels above the SOCs trend data on the number of SOCs of each type would be useful for prediction purposes. Also, as the SOCs are not evenly scattered either by area or by population across the United States, expectations on use relative to potential use would vary widely. Each SOC needs census data on population to be served, percent of population that are current users, percent that are repeat users, percent that are first time users, etc. SOCs also need information to help them predict when heavy use times will occur. This can be predicted in part from data on types of use relative to month of year. Central ERIC may be less interested in the time-bound aspect of this data, but more interested in numbers and proportions of types of use aggregated. SOC data on user satisfaction with products and services is another category that can serve two purposes -- helpful for the SOCs and necessary for the decision-making levels of ERIC.

There seem to be two major purposes for user information that exist at all levels of ERIC. The first is for internal management and planning. The second is for information exchange. In addition, as there are no absolute measures of performance for the SOCs, the Clearinghouses, or Central ERIC to assess performance against, information exchange can provide comparative data. The basis of comparison will differ, but some common set of elements with agreed on terminology and definitions will make baseline comparisons possible inter-institutionally and longitudinally.

D. A management information system should include:

1. a basis for decision-making;
2. a structured and systematic approach to information collection;
3. data collection mechanisms which are coordinated with the agency or individual who generates the data;
4. information collected from both internal and external sources.

E. A data collection system for ERIC would:

1. involve local participation down to the SOCs;
2. be descriptive and quantitative and be as simple as possible.
3. be done on a sampling basis;
4. be differentiated (not all data collected at each site);

In some cases, different but parallel sub-categories may be necessary to give the end user site appropriate data. In addition, not all items need to be collected each year or from each site in order to maintain the integrity of the total system. Clearinghouses may choose to sample SOC user information systematically on a rolling year basis rather than each year.

5. be phased in over a 2-5 year period.

F. Data Collection of Activity and Resource Use

Program Measures / Programmatic Function	FINANCIAL	PERSONNEL	FACILITIES	ACTIVITY	ANALYTIC MEASURES
DATA BASE BUILDING					
USER SERVICES					
INFORMATION ANALYSIS PRODUCTS					
ADMINISTRATION					
TOTAL					

Figure I.2 - Management Information System Matrix for ERIC

Figure I.2 demonstrates how these programmatic functions can be mapped into a series of program measures. Financial data are presently offset against the programmatic functions of the Clearinghouse. Personnel measures could easily be added either in service months or manhours, perhaps divided into professional, paraprofessional, and clerical categories. The facility measure would include items like assignable square feet and room use categories. Equipment types and availability might also be included here. The activity measures, using present descriptor items, includes the counts of number of items processed, number of workshops conducted, number of articles published, and the like.

Analytic measures or performance measures are those measures that assess the level of objective attainment. These might include, but not be limited to, criteria such as the following measures:

Policy Effectiveness
Ex.: Availability of long range plan
Number of times long range plan has been reviewed

Operations Effectiveness
Ex.: User satisfaction with accuracy and timeliness of question answering

Organizational Productivity
Ex.: Amount of activity performed per dollar expended or per service month of personnel

Accuracy
Ex.: Error rate or percent of items done correctly

Timeliness
Ex.: Lag time between initiation of activity and completion

Staff Morale
Ex.: Employee satisfaction
Average number of sick days taken
Employee turnover rate

This information simply fleshes out the present reporting system, providing a fuller picture of activity and resource use. It should prove helpful in increasing control and in developing useful longitudinal studies of Clearinghouse activity.

G. Data Collection to Examine Use Services

User Characteristics* / User Services	TYPE OF CONTACT	PURPOSE OF CONTACT	USER TYPE	PURPOSE OF END USE	PERFORMANCE MEASURES
PRODUCTS					
USER WORKSHOPS					
RESEARCH ADVISORY SERVICE					
MACHINE-ASSISTED REFERENCE					
MANUAL REFERENCE					
CLIENT REFERRAL					

Figure I.3 - User Services/User Characteristics Matrix for ERIC

*See Table 2 in the Introduction of this report which describes contact, user type, and end use.

Figure I.3 shows a matrix that juxtaposes type of service against various user characteristics.

Performance measures would be more than the usual quantity count. When appropriate user evaluations should be collected and analyzed. In order to be able to make meaningful comparisons, environmental data and target group data should also be collected.

Environmental data might include the following:

Type of Facility - whether with a university library, or a state education agency, an association, a public library, etc.

Legal Control - whether state, federal, county, school district, municipality, regional, or private

Primary Service Area - population and area

Access - days and/or hours open to user population

Target group data might include characteristics of potential user population and source of that information. (See Table 2 - ERIC User Typology in the Introduction to this report.)

H. Recommendations (in sequence of implementation)

A. Start-up for Data Collection

1. Mount a major educational campaign directed to the SOCs, focusing on their part in the total ERIC system.

2. Mount a second campaign directed to the Clearinghouses to reemphasize their responsibility for the SOCs in their geographic district.

3. As part of this campaign, set up a series of workshops or other meetings asking the SOCs to discuss their user information problems to see where (or if) a data collection system of mutual benefit to the SOCs and to ERIC could be developed. This would be a workshop somewhat different from the 1978-79 series of workshops now underway, which are intended to provide ERIC information. The emphases of the suggested workshop series would be on user information data collection, and should be organized by type of SOC (see Figure I.1).

4. Ask the Clearinghouses to conduct these SOC workshops with perhaps a representative from Central ERIC so that they would be aware of SOC user needs.

5. Ask the Clearinghouses also to meet to discuss their data collection problems with representatives from Central ERIC.

B. Standardize Data Categories and Data Collection Instruments

6. Develop a useful typology of SOCs so that comparable data categories can be established.

7. Using the outcomes of SOC and Clearinghouse information problem meetings, set up series of meetings for representatives of SOCs, Clearinghouses, and Central ERIC to develop standardized management information system.

8. Establish standard terminology and definitions for acceptable data categories for units of use, searches, reference service, research service, etc. Consider categories being developed by a Z39 committee of the American National Standards Institute.

9. Develop standard format for uniform record keeping with optional categories that can be deleted and opportunities to add categories for other local required information.

C. Periodic Data Collection

10. Use expert to help establish appropriate sample sizes and frequencies for recurring usage data.

11. Assist Clearinghouses in developing a rolling data collection plan for all SOCs in their geographic region so that all SOCs are sampled at least once every five years.

12. Select a set of SOCs that are already keeping good records and that include a range of types, sizes, and geographical areas, and set up a ten year longitudinal study.

13. At periodic intervals, engage an expert to analyze the descriptive data collected in more sophisticated ways.

14. Provide periodic data summaries to Clearinghouses so that they can compare their results with the aggregate or with selected others like them on certain characteristics.

The above recommendations involve three stages of a plan for an ongoing management information collection system for the articulated ERIC network (see Fig. I.1). There would be certain start-up (one time only) costs (Recommendations 1-9) which could cost some amount of money if the workshops or clearinghouse meetings are seen as an "extra" operation. However, if they are seen as System Improvement Projects (SIP), their costs could be absorbed in the present ERIC budget. The actual data collection (Recommendations 10-14) would require a special project to set up the data collection routines and analyze the data for the first interval. This project could cost in the neighborhood of $20,000 for staff, etc.

In summary:

(a) Resist temptation to collect more data in greater detail at any particular level than is necessary for management decision-making.

(b) Prefer accuracy to quantity and a little information freely provided to much information grudgingly given. Less is more.

EXECUTIVE SUMMARY*

Level II ERIC Usage Study

NON-EXPERIMENTAL SURVEY APPROACHES

A. Usage is the descriptive, cumulative assessment of the extent to which ERIC products and services have penetrated the workday reality of people.

1) How many have noticed ERIC?
2) Who are they?

B. Survey Approach -- emphasis on representativeness and generalizability

C. Goals of Survey Approach

1) Obtain firm estimates of use.
2) Avoid the expense of a census.

D. Remember to make sound sampling decisions and ask only valid questions.

Getting valid answers from representative respondents is what is needed. Getting valid answers from unrepresentative respondents defeats generalizability: how broadly your results apply remains unclear. If the responding group is representative, but the answers are invalid, the quality of measurement has been diluted; whether your results and conclusions can be trusted becomes questionable. To avoid such pitfalls, sampling must be based on a population which is clearly defined and accessible. Also, the information requested must be within the scope of what respondents are capable and willing to offer.

E. Cautions from previous researchers

Fry (1972) warns that "the field is so vast and diverse that only gross estimates of ERIC uses can be extrapolated to an unmeasured total universe of educators."

Unsatisfactory response rates plague even the best of survey attempts (e.g. Horne, 1976), so the reliability of their results cannot be determined. As Havelock notes, studies where mailed questionnaires result in response rates below 70% are bound to generate dubious data.

In reviewing data collection methods, Havelock singled out two studies which braved data collection through records with this comment: "Efforts to collect such data are generally reported to be hopeless because of total lack of standardization in record keeping on users." (1977) Both Fry and Horne therefore found themselves in the difficult position of drawing conclusions based on uneven quality data -- part coming from firm records, part based on respondent "estimates".

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*See Appendix of this report for consultant's report upon which this summary is based.

F. Recommendation for Type of Usage Research Program

ERIC use assessments can benefit most from a programmatic, incremental approach where consecutive studies add on to the overall use picture in a reliable manner. A regular, long-term monitoring (use) and evaluation (impact) program should be drafted and gradually implemented by Central ERIC, if at all possible. Such studies could have the following desirable attributes:

1) clear frame of reference, narrower conceptual definitions of user and use, with corresponding operationalization and measurement. The priority should initially fall on actual use and user populations (see Table 2 of User Characteristics in the Introduction of this report). Smaller, valid studies build a trustworthy picture faster; global, multi-purpose studies generate needs for further validations.

2) clear separation and reporting of results based on firm records from those extrapolations based on unsystematic observations, or opinion.

3) random probability sampling of clearly listed "populations".

4) choice of data collection method, or combination of methods, which enhance response rates.

G. Specific Example of Usage Survey of SOCs, RIE Subscribers, and Online ERIC Users

Step 1. Augment information obtained from Directory of ERIC Microfiche Collections

Additional information collected via ERIC's questionnaire for the directory is seen here as the first building block toward valid use assessment study designs. Currently, the following nine items of information are being requested:

name	equipment:	a. microfiche readers
address		b. reader/printers
phone	services:	a. hard copy reproduction
contact person		b. microfiche reproduction
collection status	charges	
	access days/hours	

We propose augmentation of this questionnaire by three more items of information:

1. under "services" add (c) computer base searching, and
   (d) lending of microfiche readers and fiche
2. add a second page for a new item heading - "records of use"

Given such augmentation, the new questionnaire will consist of two pages as follows:

Directory of ERIC Microfiche Collections

Questionnaire

Page 1
1. Institution name
2. Address
3. Telephone
4. Contact Person
5. Collection status (years covered)
6. Equipment available
   a. # of microfiche readers
   b. # of microfiche reader/printers
7. Services available
   a. hard copy reproduction ☐ yes ☐ no
      charges _____
   b. microfiche reproduction ☐ yes ☐ no
      charges _____
   c. computer base searches ☐ yes ☐ no
   d. lending microfiche readers ☐ yes ☐ no
   e. lending fiche ☐ yes ☐ no
8. Days/hours available to the public

Page 2
9. Records on use (see below)
10. Comments

9. Records on use:

Please indicate which of the following usage statistics you keep, if any:

fiche circulated	☐ yes	☐ no
fiche duplicated	☐ yes	☐ no
paper copies made	☐ yes	☐ no
manual searches	☐ yes	☐ no
computer searches	☐ yes	☐ no
orders from EDRS	☐ yes	☐ no
uses of RIE, CIJE, Thesaurus	☐ yes	☐ no
of clients served	☐ yes	☐ no
types of clients served	☐ yes	☐ no
purpose of clients	☐ yes	☐ no

other usage records
(please explain)_____

Step 2. RIE Subscriber Questionnaire

An RIE inventory would mean four times as many questionnaires and a correspondingly large directory, compared to the SOC Directory.

thus, a complete overview (census), rather than sampling, is recommended as serving the goal of full description best. The magnitude of the effort can be limited by reducing the scope of the questionnaire submitted to each RIE subscriber. Thus, we propose the following items for inclusion on <u>one</u> page:

Directory of RIE Subscribers

Questionnaire

1. Institution Name
2. Address
3. Telephone
4. Contact Person

These should be printed in ahead of time, as they are known. The respondent would have the opportunity to mark any corrections or changes that might be necessary.

5. RIE subscription status (year started)
6. Other ERIC tools available: CIJE ☐ yes ☐ no
   Thesaurus ☐ yes ☐ no
7. Equipment available:
   Microfiche readers ☐ yes ☐ no
   Reader/printers ☐ yes ☐ no
8. Any ERIC related services (please describe): ☐ no

   _____

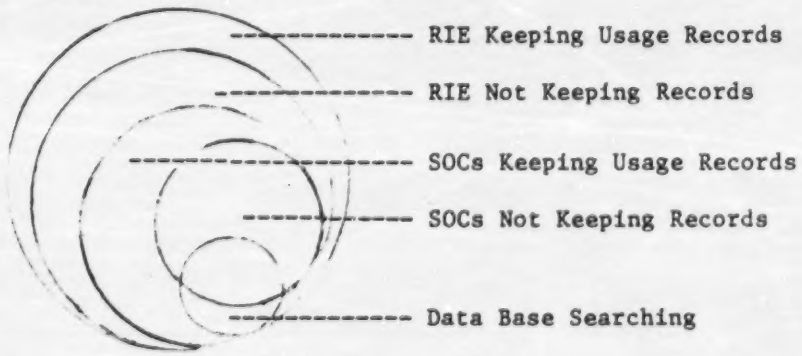
   charges: _____
9. Any ERIC related usage statistic you keep ☐ no
   (please describe): _____

   _____
10. Comments: _____

THANK YOU FOR YOUR TIME AND COOPERATION!

<u>Step 3</u>. Combine data from Steps 1 and 2.

After all responses are received and the data properly tabulated, a more specific descriptive image of non-SOC RIE subscribers will emerge. For example, RIE subscribers could be divided into relevant groups, i.e., by availability of tools other than RIE, or equipment and services related to ERIC. Most importantly, a dichotomy based on presence or absence of records (#9) can now be generated. Again, the Venn diagram, serving as our working frame of reference, is taken still one step further:



Some surprising results may introduce changes in this scheme. For example, some non-SOC RIE subscribers may report access to data base searching.

Assuming that previously described steps have been taken and the designated information obtained, two important tasks have been completed:

a) Clear separation of ERIC outlets keeping records from those not keeping records is now possible. This means that further down the line, reporting of results based on firm records can be separate from results obtained in non-record situations.

b) Proper sampling and usage-specific conceptualization of ensuing surveys is also possible.

More specifically, a project director would now have the following kinds of information:

a) # of SOCs keeping records
b) # of SOCs not keeping records
c) # of non-SOC RIE subscribers keeping records
d) # of non-SOC RIE subscribers not keeping records
e) data on what kinds of records are available (therefore, an idea as to their comparability or lack thereof)
f) the geographic distribution for all of the above
g) ancillary information as to the setting, facilities, etc.

Step 4. SOC Usage Survey

Assuming that the above mentioned information is available, the first step is to create a double distribution map, which geographically places the record keeping and non-record keeping SOCs throughout the USA. Then, two separate random samples are to be drawn from either population. Thus, the SOC survey would in fact consist of two substudies implemented in the same time period. Both subsurveys will in effect ask for the same information, though the item phrasing will differ, to accommodate the different record keeping circumstances. The exact random sampling procedure cannot be fully determined ahead of time, as the results of the augmented questionnaire and the dichotomy regarding records is presently unknown. However, at least two alternatives can be foreseen.

If the distribution of dichotomized SOCs is relatively even territorially, then there may be merit to proportionate sampling by state, or at least by U.S. regions. However, if the distribution is such that record keeping SOCs cumulate in certain areas, while non-record SOCs bunch up in others, then such proportionate sampling would be pointless. Simple random sampling may offer the best solution, should an orderly territorial pattern fail to materialize.

The size of the separate samples is also an issue for consideration. They could be proportionate in relation to the total SOC population from which the dichotomy derives. Should the two-way split prove to be extremely imbalanced -- for example, too few record keeping outlets -- then an appropriate sampling approach should be chosen to ensure that the smaller sample is of sufficient size to support validity of conclusions ($n \geq 100$).

In addition, we recommend that special SOCs (EPSIS, WISE, RISE, etc.) not be sampled along with the others. Rather, they should be contacted separately during the survey (using the same approach and instrument) and the results reported as for special cases, with possible relevant comparisons vis-a-vis the rest.

We propose the following content for the survey questionnaire, designed for self-report by respondents. Note that all known information could be lifted from the SOC Directory and pre-coded on the form sent to respective institutions. A provision for correcting or updating of precoded information should be made.

ERIC Microfiche Collection

Survey Form
(for record-keeping SOCs)

1. Name of Institution _____
2. Address _____
3. Telephone _____
4. Contact Person _____
5. Type of Institution

   ☐ College of University Library
   ☐ Public Library
   ☐ Information Center
   ☐ Research and Development Laboratory or Center
   ☐ School System
   ☐ BOCES
   ☐ Other (specify) _____

Please make corrections where applicable

(PRE-CODED)

6. Location of the ERIC collection materials or services: (please mark appropriate box)

	Reference Section	Microforms Section	Government Documents	Curriculum Center	Periodicals Center	"ERIC Room"	Other (specify)
ERIC Microfiche							
Resources in Ed. (RIE)							
Current Index to Journals in Ed. (CIJE)							
ERIC Thesaurus and Other Ref. Tools							
Microfiche Readers							
Microfiche Reader/ Printer or Printer							
Fiche Duplication							
Computer Searching							

7. How would you characterize the placement of ERIC materials and services at your institution?

   ☐ consolidated in one location
   ☐ located within brief walking distance
   ☐ dispersed
   ☐ other (explain) _____

PLEASE FILL IN USAGE STATISTICS FOR THE PRECEDING YEAR (12 MONTHS) IN THE CATEGORIES APPLICABLE TO YOUR ERIC FACILITY: (In case your records cover a different time period, please so indicate. Leave blank categories which do not apply to you.)

8. Services and materials:

   # fiche circulated _____
   # fiche reproduced _____
   # paper copies made _____
   # manual searches _____
   # computer searches _____
   # orders from EDRS _____
   # uses of RIE _____
   CIJE _____
   Thesaurus _____
   # IAPs circulated _____
   # equipment loans _____
   # questions _____

9. Mode of service requests:

   # or % in person, walk in _____
   # or % by telephone _____
   # or % by mail _____

10. Total # of clients served: _____

11. Types of clients served:

   # elem/secondary school teachers _____
   # elem/secondary students _____
   # administrators (K-12) _____
   # school librarians, media specialists _____
   # ancillary staff (counselors, etc.) _____
   # school board members _____
   # BOCES staff _____
   # college faculty _____
   # college administrators _____
   # graduate students _____
   # undergraduate students _____
   # community individuals _____
   # government (local, state) agency staff _____
   # others (specify) _____
   _____

12. Purpose of clients served:

   # elem/secondary instruction _____
   # college instruction _____
   # elem/secondary school work _____
   # college course work _____
   # theses and dissertations _____
   # program development _____
   # curriculum development _____
   # proposal development _____
   # administrative planning _____
   # personal/professional development _____
   # other (specify) _____
   _____

13. Do you promote or advertise the availability of the ERIC facility?

   ☐ yes ☐ no

   In what manner?

   handouts or brochures
   displays
   orientations and seminars
   library tours
   personal contact
   audiovisual materials or presentations
   other (specify) _____

14. Do you provide user orientations to ERIC?

   ☐ yes ☐ no

   In what manner?

   chalk talk or lecture
   tour of ERIC facility
   handouts or brochures
   audiovisual materials or presentations
   other (specify) _____

15. Do you have signs guiding users to the various parts of your ERIC facility?

   ☐ yes ☐ no

16. Would you be willing to help ERIC prepare a standardized SOC record-keeping format sometime in the future?

   ☐ yes ☐ no

17. If ERIC prepared such a common SOC record-keeping form, would you be interested in using it?

   ☐ yes ☐ no

The non-record keeping version of the above questionnaire would employ a different wording for the heading which precedes usage items (#8, 9, etc.):

PLEASE ESTIMATE THE APPROXIMATE USES OF YOUR ERIC FACILITY DURING THE PRECEDING YEAR (12 MONTHS) IN THE FOLLOWING CATEGORIES:

(same categories)

A footnote should be added: "If monthly or quarterly estimates are easier for you, please provide these, so noting."

EXECUTIVE SUMMARY*

Level III ERIC Usage Study

TRUE FIELD EXPERIMENT TO STUDY IMPACT ON END USER

A. True Field Experiment (Empirical Study) should have:

1) Trustworthiness, i.e., data collected accurately and free of distortion
2) Generalizability, i.e., results can apply to other units and situations
3) Random assignment of units (end-users) being studied
4) Withhold some ERIC product from one group of end-users to note change in life of "treated" group

B. Necessary Precondition:

1) Remember to consider:
   a) obtain micromeasures as well as macromeasures
   b) measure non-users as well as users
   c) obtain trustworthy measurements

2) Possible measures of impact:

   a) savings
   b) novelty
   c) uses

   (Please refer to "Impact of ERIC on the User" graph on following page.)

3) Approaches to Measuring Impact -- Interview Instrument

   1) Obtain a sample of education professionals and other potential ERIC users. In a survey it will be important that the sample be representative. In a true field experiment representativeness, though valuable, may be compromised in order to obtain a comparison group. Notice that the focus is on the person and not on ERIC. Consequently the sample will include both users and non-users.

   2) Interviewers ask each respondent to identify a recent, salient problem, worry, or concern of a professional nature -- something like, "as a professional, what's bothering you?" At this stage of the questioning it is important to focus on the problem and not on ERIC. In fact, it may help if ERIC is not mentioned until the end portion of the interview.

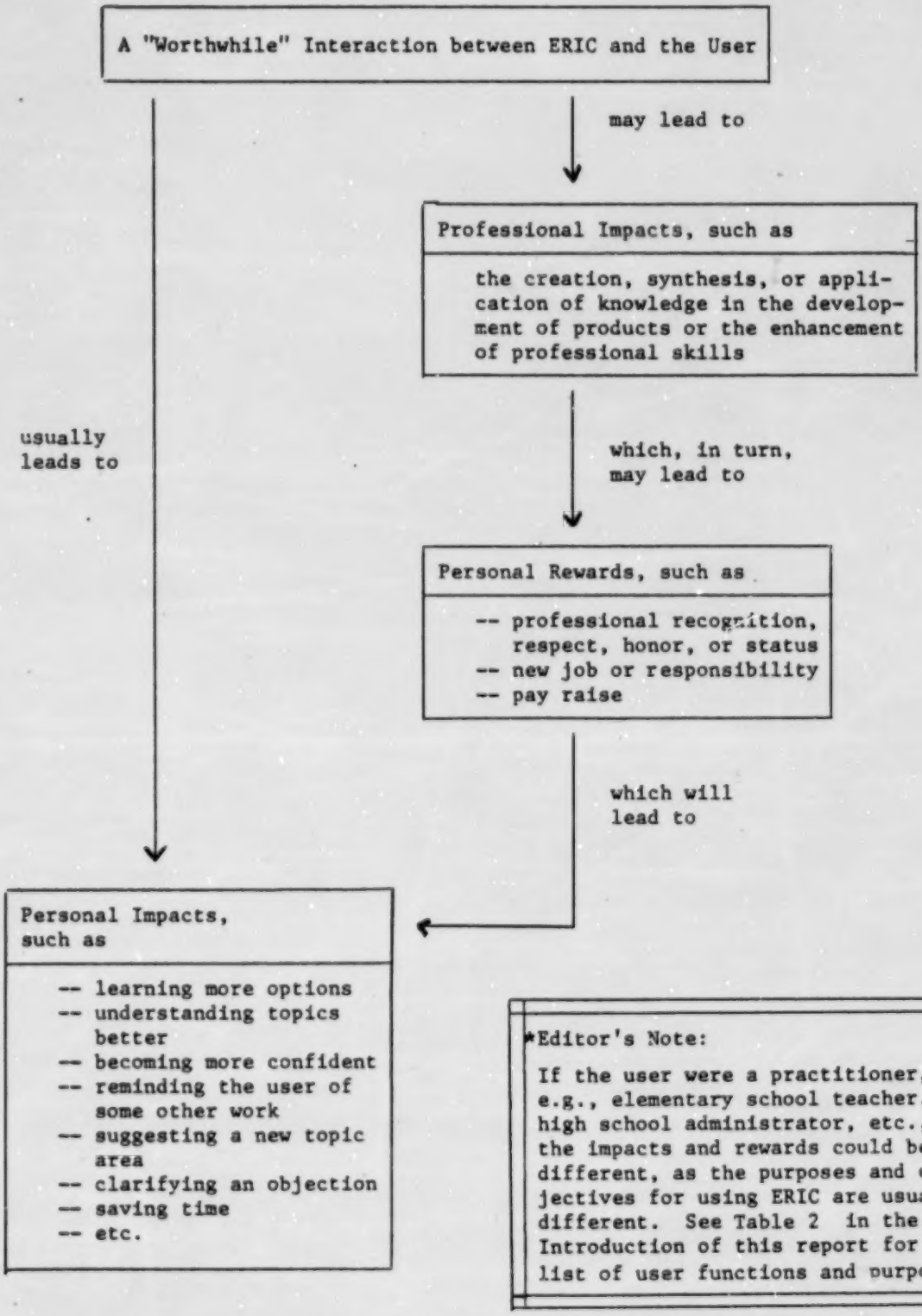
      The problems (or worries or concerns) can still be unresolved or they may have already been resolved. What matters is that the respondent can recall the problem in some detail.

   3) All important aspects of the problem are then listed in chronological order. This take is aided considerably by dividing it into a few separate steps. First ask the respondent what single thing is

*See Appendix of this report for consultant's report upon which this summary is based.

Figure III.1

IMPACT OF ERIC ON THE USER - WHO IS A RESEARCHER*


A "Worthwhile" Interaction between ERIC and the User
may lead to
Professional Impacts, such as
the creation, synthesis, or application of knowledge in the development of products or the enhancement of professional skills
usually leads to
which, in turn, may lead to
Personal Rewards, such as
-- professional recognition, respect, honor, or status
-- new job or responsibility
-- pay raise
which will lead to
Personal Impacts, such as
-- learning more options
-- understanding topics better
-- becoming more confident
-- reminding the user of some other work
-- suggesting a new topic area
-- clarifying an objection
-- saving time
-- etc.
*Editor's Note:
If the user were a practitioner, e.g., elementary school teacher, high school administrator, etc., the impacts and rewards could be different, as the purposes and objectives for using ERIC are usually different. See Table 2 in the Introduction of this report for a list of user functions and purposes.

best remembered about the problem situation. Then ask for all events which preceded that one, and then all events which follow it.

4) Respondents are asked to identify those things they wanted to learn more about as they dealt with their problem situation. Reviewing each of the problem steps will help the respondent recall what information was sought or what he tried to learn more about or understand better.

5) Then for each thing they tried to find out about, the respondents are asked:

   a) How did they try to find out about it?
   b) Did they succeed in finding out about it?
   c) If so, did it help (i.e., did finding out help the respondent deal with his professional problem, worry, or concern)?
   d) If it helped, how did it help?
   e) If it did not help, why not?

   Questions (a), (d), and (e) are open-ended; there is not any checklist nor any mention of ERIC. Analyzing the responses to these questions requires some diligence. Dervin's content analysis categories are a good place to start, but they will need to be changed somewhat to include ERIC and alternative information sources available to professionals in education and related fields. Question (d) is the "how" question for personal impact. And question (e) provides micromeasures for a failure analysis.

6) Later in the interview respondents can be asked specific questions about ERIC and the role it plays in their professional lives.

C. Four Research Designs (not equal alternatives) -- not truly experimental

Design	How Many Before and After Measurement Periods	How Many Groups of End-Users	Level of Trustworthiness
I	1	1	unacceptable
II	several	1	acceptable
III	1	2	better
IV	several	2	best

Design I is quite simple. Collect impact measures from a sample of end-users before the change is implemented and repeat the process after the change. In any study of people, this is a particularly weak design because it is almost impossible to correctly attribute any differences between the two sets of measures to the change (see Katzer, Cook, & Crouch, chapter 11). Unfortunately, it is frequently employed by managers and administrators to determine the effect of a change in policy or procedure. Usage studies in information systems are especially vulnerable: the manager compares the previous set of usage figures with current data and attributes the difference to some specific change which occurred in the interim.

Design II -- By making use of several before and after measures, a careful researcher is more able to identify the effect of the change on the end-users. It is important that the different measurements be the same or comparable -- the same instruments and observations taken from comparable samples of end-users. Either the same group of end-users can be measured every time (as in a panel study), or different random samples of end-users can be employed. Each alternative has its attractive features and its liabilities. The panel study is subject to systematic "dropping-out" of participants, biasing the panel and possibly causing whatever differences are obtained between the before and after measures. Use of different random samples eliminates this problem but prevents any assessment of the long run effect (impact) on individual end-users. Analyzing the results of this design is not straightforward and will require some expertise in statistical techniques (see Glass, Willson, and Gottman).

Design III needs to be described in more detail. It requires two groups of end-users: the members of one group are able to avail themselves to the change, those in the other group are not allowed to do so. This design differs in three important ways from the first true experimental design described earlier:
(1) Design III requires one set of before measures from both groups of end-users.
(2) Design II can use intact collections of end-users -- such as two SOCs; the experimental design requires that the groups be created through randomization.
(3) Design III uses a coin-flip to decide which group is to be given the change in procedure or policy; the experimental design uses a coin-flip to decide group membership for each end-user.

Design IV can be implemented in the following manner. For the purposes of simplifying the presentation, only two units (naturally occurring collections of end-users) will be considered.

1. Identify the two units. Ideally, these should be as similar as possible in terms of all measures related to impact. And therein lies most of the difficulties with this design. If the two units are selected because of availability or by administrative ruling, they may not be similar enough. If the researcher is permitted to choose among several available units those two which are most similar, the selection procedure itself may decrease the trustworthiness of the findings. To avoid, but not prevent, the latter problem, the before measures should <u>not</u> be used to find similar units, not should any end-users be discarded from a unit in order to improve the degree of similarity.

2. Make or permit the proposed change available to one unit and withhold it from the other unit. The choice between units should be determined randomly if possible.

3. Devise an instrument to measure the impact of the proposed change. Try to have all end-users, or a large random sample of all end-users from each unit complete the instrument.

4. Tabulate the results and compare the two sets of end-users. If the two units were similar enough on all essential variables, then any difference in impact between the units can be attributed to the change.

D. General Considerations

The diversity and characteristics of the various ERIC products and services precludes any single research design to assess their impact.

ERIC has control over the type of products and services offered, their format, style, arrangement, and frequency. Any planned change in one or more of these characteristics has the potential to be studied experimentally -- such as by introducing a new product slowly and at random, or by maintaining both the old and new versions with random distribution of each. For example, a new thesaurus can be distributed to the SOCs in two waves; the first wave to a random half of the SOCs and the second wave to the remaining SOCs, but only after collecting impact data from end-users or both groups of SOCs.

In a similar vein, experimental or acceptable non-experimental impact studies can be implemented whenever new organizations are added to the ERIC system as SOCs. Randomly pair the organizations and delay providing materials to one set of the pairs until after the impact study is completed.

Assessing the impact of computer tapes is more difficult because ERIC does not provide a computer searching service. Some experimental studies of the computer tapes may require the cooperation of the service providers. Or, it may be possible to produce two versions of the computer tapes and distribute each version to a different group of service providers. By carefully choosing which SOCs to study, an experimental, or an acceptable non-experimental design is possible.

And lastly, users and potential users of carefully selected SOCs and CHs should be queried on a regular basis. This will begin to implement a regular study of performance and impact, it will obtain micromeasures, and it provides the needed before measures if any one of the three acceptable non-experimental designs are to be carried out at a latter time.

E. Detailed Example of ERIC Impact Study: Impact of Information Analysis Products (IAP)

Information Analysis Products (IAPs) are an important and expensive component of ERIC. Well over 1000 were produced by 1975. Several years ago they occupied a larger portion of each CH's budget (Wanger reports 40-45%) than they do now (about 10-20%), but that is still a considerable amount of money. Presumably the intended impact of the IAPs is to make the materials more accessible to, and more understandable by end-users.

A true field experiment. In order to remove the potential problem of self-selection inherent in survey research, it will be important to make a comparative analysis among groups of educators who are (or who are not) ERIC users. In this proposed study only ERIC users will be included.

The users need to be identified and randomly split into two relatively homogeneous groups: those who received one or more IAPs and those who have not. Given that the users in both groups requested the IAPs and given a large enough sample of educators in each group, then any difference between the groups in terms of various impact measures can be attributed to the IAPs.

The study can be conducted at a single CH or at many CHs. And depending upon the scope of the study, it may require the cooperation of EDRS in order to include those users who request IAPs from that source. For simplicity the study to be described here is in terms of a single CH.

1. When requests for IAPs are received, a coin-flip is used to decide whether or not the request will be honored. Those to be denied the IAP can be told it is "out of stock" and their order will be held until more copies are printed. The length of time these orders would be held would be determined by time when Step 2 of this study was activated. No one who requested the IAP would really be denied.

   A complete record of each IAP request is needed including data of request, requestor, IAP requested, and whether the request was honored. If the demand for certain IAPs is particularly heavy it would be useful to stratify the groups in terms of IAPs; try to keep an equal number of denied and not-denied requests for each of the high demand IAPs.

2. At some time later contact all requestors to determine the impact of the IAPs. For bibliographies one could ask if the citations found were previously known. Were they read? Were they thought to be useful? Were they actually used? And if so, how were they used? Notice that the same question will be asked of those denied and those not denied. For review articles the measurement problems are a bit more difficult, but one possibility is to interview requestors of the same IAP and ask what they have thought about and completed since the request. Were those denied more likely to drop a line of inquiry? Were those denied less productive in terms of the subject

matter in the IAP? Did it take a longer time for those denied to discover the information in the IAP?

The interviews can be conducted by mail, phone, or in person, depending upon the depth and complexity of the specific question asked and the budget of the study. It is important, however, to ascertain the fact that those denied an IAP by the CH did not obtain a copy elsewhere.

The timing of this interview is important and with a large enough sample size it would be best to conduct the interview over different subsets of requestors at different time periods -- say two weeks after replying to the request, and also one, two, four, and six months after. This would permit an assessment of "catch-up" time which, as mentioned earlier, is in some sense an impact measure.

3. When the study is completed it may be useful to maintain a more limited program of random denials for IAPs across all the CHs. If properly conducted, it can provide a trustworthy mechanism to assess any changes in ERIC policy or procedures regarding the IAPs.

F. Summary

Impact is the ultimate goal of any information system -- to have an effect on the lives of its users. However, studies of information systems rarely deal with impact primarily becuase it is difficult to measure. Instead, other goals or sub-goals (such as effectiveness or efficiency) are analyzed. The purpose of this paper was to discuss and recommend methods and measures which could be used in future studies of the impact of ERIC. Certainly few of these recommendations are new. But becuase they have not found their way into research practice they bear repeating.

The major methodological recommendation is to use true field experiments. None of the existing ERIC "impact studies" was experimental -- causing their findings to be less clearly interpretable. Gilbert and his colleagues reviewed research studies in other human service areas and concluded that:

> "One characteristic of nonrandomized studies that shows up in context after context is that even after repeated studies had consistently gotten the same results, there was always room to doubt the validity of the finding." (p. 134)

And, note that these authors found interpretation difficult even when several studies agreed. Studies of ERIC impact are too few and too different to form a reliable basis for estimating the amount of agreement among their results.

No single measurement recommendation was made. Instead future researchers are encouraged to make use of those procedures and standards which are relatively well known. From the literature of information systems comes the suggestions to include non-users as well as users (no surrogates). Focus the initial questions on people or their information needs rather than on the particular system being

studied. And lastly, include the users' interactions with all components of the system and with his friends and colleagues afterwards (indirect usage). From the literature of social science measurement comes the suggestions to use several measures instead of one, including the use of unobtrusive measures. Improve the reliability and validity of all measures by pretesting, removing ambiguity, using critical incidents to aid recall, training interviewers, etc.

Taken together, these suggestions will improve the state of practice of impact assessment.

After surveying studies of ERIC, only 16 could be found which contained some impact component. Some of these studies were impressive in scope and in execution (e.g., Asher & Vockell; Fry; Hood; Sieber; Wanger). None of the 16 studies made a major or unique breakthrough in the measurement of impact. This is not a criticism, but rather a reflection of what seems to be an accurate picture of the current state of impact measurement. New and powerful methods for measuring impact may not be easy to come by and the surest road toward better impact is the systematic application of procedures which have been tried in related research areas.

Bibliography of ERIC Usage/Impact Studies

This bibliography represents the literature we collected on ERIC as we worked on this project from May to December, 1978. We are grateful to Mollie MacAdams at NIE, Dorothy Slawsky at the ERIC Facility, and Eleanor Horne at ERIC/TM for many of the references. Ronald Havelock's paper (in draft) also provided many references (these are noted with an asterisk *). We consider this a fairly comprehensive list of ERIC usage studies. These reports, some in hard copy and others in microfiche, will remain as a set at ERIC/IR for use by other researchers. An annotated list of these reports with an analysis by state will be with that collection and made available upon request to user services librarians by ERIC/IR.

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DESIGN OF ERIC USAGE STUDIES

Proposed Methods for Data Collection and Analysis

An ERIC/IR Special Project (May 1 - November 1, 1978)

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